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ABSTRACT

As part of a two-year project that examined the processes by which children initially approach the reading task, the second phase of a preliminary study was devised that modified the pretest, the instructional modes and format, the sequence and amount of information presented in the instructional sessions, and the procedures for testing and recording study results. The pretest was expanded to provide information on the child's reading-related abilities and his/her understanding of the nature, purpose, and meaning of the reading task. The modifications in the instructional process combined the instruction, observation, and probing questions of the first phase with a systematic approach to the study of the children's ability to generalize new material and a series of experimental tasks that tested the hypotheses relating to the individual child's reading responses. (MAI)

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PRELIMINARY REPORT

EARLY DECODING AND ENCODING STRATEGIES PROJECT - PHASE II

OCTOBER 1976 - APRIL, 1977.

Teachers College, Columbia University, New York

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CS004561

The current phase of the EDS Project was a direct outgrowth of the work in the first phase (September 1974 - May, 1975). During the first year we worked with four children, two each in the part-to-whole (P-W) and in the whole-to-part (W-P) approach. In designing the second phase, many of the procedures and materials developed in Phase I were utilized. But careful evaluation of the first year's work led to several major modifications in the pretest, in the instructional modes, in the sequence and amount of phonemic information presented, in the format of the "instructional" sessions, and procedures for testing, and in recording procedures.

1. THE PRETEST

The initial screening test (described in A Preliminary Report of the Early Decoding Strategies Project, Aug., 1975) included measures of seven reading related or pre-reading abilities. For use in the second phase, the test was modified and expanded to a) tap additional reading-related abilities which would extend the information by which to determine a child's placement in one of the methods and b) tap the children's understanding of the nature, purpose and meaning of the reading task.

a. Additional Reading Related Tasks. The following tasks were added to the original test:

1) Knowledge of all letter-sound and letter-name correspondences;

2) Segmentation of consonants and vowels in the middle and end of words as well as at the beginning;
3) Blending of vowels and consonants to form words;
4) Encoding selected words.

b. Exploring Children's Understanding of the Reading Task. The information gathered in the first phase through probing questions and children's voluntary comments allowed us to generate various hypotheses concerning children's beliefs about the purpose of reading, its relation to spoken language and the rules which govern the form and structure of written language.

To test some of these hypotheses, a second section of the pretest was developed (identified as Part I) including such information as the following:

1) The kind of material which can be read (words, pictures, designs, etc.).
2) The kinds of sounds that can be "written" (i.e. human vrs. non-human).
3) The relation between the appearance of words and their meaning (big - BIG, little - LITTLE, etc.).
4) The difference between oral and written language (characteristics assumed to be associated with read material).
5) The effects of the orientation of letters with identical components (b - d - p - q) and the direction in which one reads.

6) The kinds of things one can do once having "learned to read."

7) Whether nonsense words are perceived as "bad" or "wrong" reading or whether meaningless words can be read just as well as meaningful ones.

The pre-test was administered to 46 children at the beginning of their kindergarten year. The data from all the children on the two parts of the test will be analyzed to provide information on the range of kindergarten children's pre-reading abilities and their beliefs about the reading task. A copy of the pretest is appended to this report.

2. INSTRUCTIONAL MODES.

In Phase I, (1974 - 1975), children were provided with one of two kinds of information. They either received phonemic equivalents of letters which they had to "blend" into words (P-W), or they were presented with whole words, without any phonemic information. They had to learn to recognize whole words and from them they could generalize to new combinations of the letters in their sight words (W-P). Although two of the children made effective use of the instructional mode to which they had been assigned, one of the children in the P-W method readily learned the sound equivalents of letters, but could not blend them. However, she showed excellent ability to identify and retain whole words and thus forced a change in the instructional mode. It was, therefore, decided to include

a "mixed method" (M-M) in Phase II. Thus, in addition to two children in P-W and two in the W-P modes, two children were assigned to an instructional mode in which they were presented with whole words as well as phonemic information. In this method the children were free to use the information which they could process most effectively.

The revised pretest proveded a better basis for assigning children to one or another of the instructional modes than had been possible in Phase I.

3. THE SEQUENCING AND TIMING OF INSTRUCTIONAL PRESENTATION.

As in the first phase, the letters and phonemes presented in each unit in the several instructional modes were held constant. The use of ita. made such a procedure possible, allowing for the inclusion of a greater range of words both for encoding and decoding than would otherwise have been possible. The content of the units was modified to control the relative difficulty of the auditory, visual and articulatory characteristics of the letters.

Three units were constructed which established the order in which phonemes and whole words composed of the same phonemes were presented. Unit 1 contained s, a, m, p, t, n, d, in that order. Unit 2 included i, r, l, c, b, f, w, and Unit 3 contained ʃ, k, e, h, ɪ, g, æ. For the first unit, several sight words--a, ðe, ɪz, on--were taught to all the children, regardless of presentation

mode. This facilitated sentence construction.

While the order of presentation of the information was held constant, the pace at which each child moved through the units varied. However, rather than delaying the introduction of new material until the child had demonstrated near perfect performance on earlier material, a criterion of about 50% correct responses was met before new material was presented. The decision was prompted by the recognition that in the first phase the children did not have enough information to demonstrate their ability to generalize their knowledge to new letter combinations, especially meaningful ones. As a result of the new presentation pace, four of the six children were exposed to the material of two and a half to three units. It became apparent that the addition of new information, rather than interfering with the retention and use of earlier material, tended to facilitate it, although the children did show some temporary confusion when new vowels were introduced.

While the grapho-phonemic information was held constant across treatments, the process information differed considerably. In the P-W approach, the children received the phonemic information which they did not already know and, if they needed it, were given some instruction in auditory blending. Words presented for decoding were never "taught to the child if he/she failed to decode them.

The only exceptions were the sight words which all the children were taught.

In the W-P approach, the children were explicitly taught a series of sight words, largely the same words which the P-W children had to decode or encode. No instructions were given to segment words for encoding or to "sound out" and blend words for decoding, nor was assistance offered in identifying letter-sound correspondences. While attempts to segment and blend were positively reinforced, minimal instructional sequence accompanied these efforts.

For the Mixed Method (MM) children, both kinds of content and process information were made available but not for the same material. So, for example, the child might be taught the phoneme /b/ quite explicitly, but would himself have to deduce the sound of the letter s from learning the sight word "sam" or "sat." Theoretically, this should have made it possible to determine which mode of presentation was most productive for the particular child. As will be documented in the final report, one of the MM children had great difficulty in mastering either whole words or evolving a blending strategy so that his performance yielded minimal information on the relative ease of the two modes of dealing with phonemic information. The other child in the MM group turned out to be a "natural" context reader. Although she had some difficulty in reading words in isolation and, therefore, did not

appear to be a full-fledged "reader" on the pretest, it was soon clear that she could read the same words readily, with only a few "logical" errors, when they appeared in a meaningful context. As a result, she entered the experiment with a fairly developed decoding strategy of her own which did not evolve through exposure to the experimental treatment.

4. THE FORMAT OF THE INSTRUCTIONAL SESSIONS.

Theoretically, the study of children's early decoding and encoding strategies can be approached through a) observation of "natural" behavior, b) controlled experimentation and c) evaluation of specific teaching procedures.

The observational method, with minimum deliberate intervention, yields the richest source of information on the child's "natural" approach to a new task. It allows for careful mapping of the processes through which the child identifies and uses information available from the environment and on how he/she tries various strategies for making sense of the information until the child finds the most suitable one. In this type of study, the data are derived from examining the behaviors naturally emitted by the child rather than those elicited by the researcher in response to specific imputs. Such a mode of study is especially useful for charting the development of "natural" abilities, such as walking or speaking but is harder to apply in situations where the abilities or interests

require exposure to information not generally available in the child's natural environment, such as letter-sound correspondences.

The experimental approach involves the introduction of specific tasks by the experimenter in order to study the child's behavior. Here the intent is to elicit a specific set of behaviors from the child rather than to wait for the child to demonstrate his/her own natural behaviors in his/her own good time. This approach has the advantage of examining a narrow range of predetermined behaviors under controlled conditions. It discourages or ignores other behaviors perceived as irrelevant to the specific experimental task, behaviors which might be more salient for a particular child and more indicative of his/her natural strategies than those induced by the experimental condition.

The third approach involves teaching the child predetermined information and then examining the degree to which that information has been mastered. Here the data relate to the child's acquisition and mastery of knowledge and skills rather than the demonstration of evolving strategies.

In the first phase of the EDS project, direct instruction was combined with observation and extended by the use of probing questions. In the second phase, instruction and observation and probing questions were

retained, but the direct instruction was limited to the presentation of information and involved minimal teaching of processes. The more lenient criteria for mastery and the curtailed use of probing questions allowed for the presentation of more information.

In addition, two major modifications were made in the original procedures: a) a systematic approach to the study of the children's ability to generalize to new material was evolved, and b) a series of experimental tasks were designed throughout the year to test hypotheses relating to the apparent difficulties and strategies which an individual child's responses suggested.

a. Common Tests of Generalization.

The development and application of decoding and encoding strategies could best be observed as the child attempted to use the available information in new contexts. Thus, procedures were designed to test to what extent each new grapho-phonemic element and/or bit of process information was not only assimilated by the child, but how well he/she was able to transfer and apply the information to new situations. We were interested not only in the correct transfer of information, but also in the errors of generalization, since both kinds of responses served as indications of the child's current decoding and encoding strategies.

The concept of testing for generalization was

translated into two types of testing procedures: one of the procedures was standard for all children and was predetermined on the basis of the teaching words which immediately preceded the testing. For example, after the P-W children had been taught the phonemes /i/, /s/, /a/, /m/, /p/, /t/, /n/, /d/ and /c/ as well as the common sight words "the", "is" and "on", and the MM and W-P children had been taught the words sam, pat, pam, sat, and, tap, mat, and tim and the three common sight words, all children were asked to "read" or "figure out" the syllables nip, dit, mit and pim, and to encode (by assembling letters) nis, dim, sit and tip. These words had never been taught to any of the children nor had they been seen by them before. However all the component elements had been made available to the child either explicitly, as phonemes with their corresponding graphemes, or in the context of whole words (depending on the particular method). On these tasks, the children were not given the correct response, but were told if they had responded correctly or incorrectly, in order not to give them misleading positive reinforcement for errors. Often the children were asked which part of their responses they thought were correct or incorrect.

Testing for generalization provided quite

different information when interpreted in the context of each of the teaching methods. In the example above, for the W-P children, the generalization test served to show whether the child had acquired the element of phonemic information /i/ by isolating it from the teaching word "tim" and then using it in combination with phonemes extracted from other teaching words. For the P-W child, the above task represented a test of blending the explicitly taught phonemic information /i/ into a new word or syllable. Thus, the P-W child needed only to "rework" or recognize and blend the sounds in new combinations, whereas the W-P child first had to break out the single phonemes before he/she could blend them into new combinations. The MM children could apply some information explicitly taught and other information derived from a whole word context.

The various words used in testing for generalization were designed to tap differential position effects (e. g. "m" in initial and final position) as well as meaningful words versus nonsense. In addition, both encoding and decoding words were included in the testing for generalization since it was recognized that these two strategies may develop in rather different manners and complement each other in significant ways.

b. Testing Hypotheses About Children's Strategies.

The second procedure used in testing for generalization involved individually tailored non-standard decoding and encoding tasks, as well as direct questioning of the child. The material for these tests was not predetermined but was based on the session-to-session observations of the child's decoding and encoding responses. In this procedure, an observational and experimental approach were combined. During the course of a session, the examiner-observer team observed many behaviors for each child. During the session, the team made direct inquiries of the child about, for example, why he/she chose certain letters or decoded in a particular manner. Following the session, the researchers who worked with the child in consultation with the other members of the project, went over the record looking for regularities in the child's behavior, and then generated hypotheses about the child's current strategies. The hypotheses were based on an analysis of responses to the material which was taught, on answers to the common generalization tasks, as well as on any other behaviors observed during the session. Specific tasks were then designed to test the hypotheses. During the following session, the hypotheses were tested and, if verified, enabled us

to determine and document the child's current strategies.

The individually-tailored tests of generalization varied widely from child to child. For instance, KM's responses on the standard generalization words led to the hypothesis that she was not attending to vowels in non-initial positions, and a long list of decoding and encoding words was drawn up to test this hypothesis. In this case, direct questioning did not yield adequate information since the child was unaware of her strategy. KM's responses to the list indicated that although she was attending to consonants and consonant clusters in initial and final position as well as to vowels in initial position, she was not attending to vowels in any other position and thus, for example, freely interchanged the word "sit" with "sat".

Three additional examples of how experimental procedures were tailored to test hypotheses or answer questions about individual children's performance follow.

1) K.D. (W-P) had difficulty remembering the words he was taught and frequently read them from right to left. It was not clear whether he disregarded direction or whether his preference was to start at the right. It was hypothesized that K.D. believed that direction was unimportant to word identification.

At the next session, he was presented with five of the words he had been taught, and which he could read correctly--at, is , mat, sat and sam--but with the last letter reversed so that he saw ta, si, tam, tas and mas. He read the words quickly and easily but incorrectly as at, is, mat, sat and sam. It was clear that he believed that sat and tas were the same word and that order of letters was not an important factor. He expressed surprise when told by the researcher that it was important to begin at the left.

2) A.Z. (P-W) had evolved a very effective sounding out strategy. She approached each word phoneme by phoneme and then blended them into the word. She continued to apply this strategy even to words which she had decoded many times before. It was not clear why she was doing this. To discover whether A.Z. applied the sounding out procedure to previously read words because she was following what she believed to be "the rules of the game" or because she did not "remember" the words she had read, she was presented with a series of familiar words on flash cards and instructed to "just say the word, don't sound it out." She made many more errors in this task than she made when sounding out and resisted responding to words which were exposed for only a few seconds. Her behavior revealed that the sounding-out process was

not a function of doing what she thought was expected of her, but rather a necessary strategy without which she was considerably less successful at reading unfamiliar words.

3) K.L. (MM) had great difficulty in remembering whole words or in utilizing phonemic information either in decoding or encoding. Frequently, he would use a letter name rather than its sound in trying to figure out a word. We wondered whether K.L. would b. able to encode orally, by spelling words using the letter names, and then translate his oral response into assembling the correct letters. To test this hunch, K.L. was presented orally with a series of words and asked to "spell" them out loud and then assemble them on the felt board. His procedure was to say a letter name and then find it and place it on the board. What was particularly interesting was his use of the few words he could read and spell perfectly--superman, man, batman, robin--as mediators in spelling other words. For example when asked to spell <u>at</u> he responded by saying, "the second letter in man, <u>a</u>, and the third letter in bat, <u>t</u>," as he found and positioned the letters correctly. It appeared that K.L. was more successful in going from the word to the letter names and then to the symbols, than he was in identifying and using either phonemic or con-

figurational information.

These examples illustrate the way in which an individual child's strategies in response to the reading task can be clarified by devising special experimental tasks through which to test hunches or answer questions derived from observation of the child's response patterns. Thus, Phase II of the project succeeded in combining teaching, observation of responses to taught material and to unknown material and the use of mini experiments through which to verify the interpretations of the observed behavior.

5. PROCEDURES OF RECORDING AND INTERPRETATION.

During the first phase, all sessions were tape-recorded and, in addition, a large proportion were also videotaped. Because the observer member of the team had to manipulate the video taping equipment and because of reliance on these tapes, the note taking during the sessions was minimal. In attempting to analyze the first year's data we found serious omissions in the data. Sometimes the video equipment didn't work at all; in other cases the cameras did not focus properly on the materials or on the child's manipulative bahavior. Furthermore, total transcriptions of the audio tapes required long and costly hours of secretarial time and were not available for immediate analysis of the sessions.

As a result, the procedure evolved for the second

phase relied much more heavily on careful note-taking during the session. The observer noted comments made by the child or the examiner, all materials used, and all manipulative behaviors. Since all the sessions were also tape recorded, the tapes were used to supplement the observer's record of verbal material and did not need to be fully transcribed.

From the observer's records, even before they were supplemented by material from the tapes, it was possible for each team to write up a brief progress report following each session of work. (This involved three 20 minute per week sessions from November - mid-January and two 30 minute sessions per week from mid-January - April). The progress report included, in outline form, all the material presented to the child in each session: previously taught material, new material introduced, generalizing words, and the child's responses. In addition, mini experiments were described. The child's general behavior during the sessions was also noted.

The project staff met weekly for three hours and a portion of each of the meetings was devoted to a report on one or more of the six children at which time composites of the session-by-session summaries were presented. These composite summaries were used as the basis for discussion of the child's performance and allowed for careful attention to the child's decoding and encoding

responses. Hypotheses as to each child's strategy were formulated and procedures were designed to test them.

The recording, summarizing and discussion procedures proved highly effective in enabling the staff to monitor each child's movement, suggest new procedures and hypothesize explanations of each child's responses.

6. PLANS FOR ANALYSIS AND REPORT OF FINDINGS.

The current plan is to devote the next eight weeks to analyzing the material for each child, to trace the child's patterns of performance, to evaluate what he/she revealed about his/her beliefs, attitudes and "reading" and "writing" strategies. In addition, the individual protocals will be examined for generalizations which apply to all or to more than one of the children. We anticipate having a final report ready by the end of August, 1977.

COMMENT.

One of the outcomes of our analysis to date is an increased realization of the importance of the encoding process in learning to read. This is especially true for some children who find it easier to encode than to decode and who may learn to read more readily if given many encoding opportunities. Such opportunities for beginning readers are greatly facilitated by the use of the ita. medium which frees the children from the constraints of the inconsistency and redundancy inherent in traditional orthography. Since the motor coordination needed for

actual writing is far too difficult for young children, the encoding process needs to be carried out with various manipulative materials such such as felt or magnetic letters or typewriter keyboards. We will have more to say about the importance of encoding in the final report.

APPENDIX: CURRICULUM (UNITS 1, 2 & 3)

UNIT 1

Content in this phase was experimented with as we sought to identify the best procedure for controlling introduction of new material. As a result there is not an exact 1 : 1 correspondence between the P-W and M-M methods with the W-P method.

P-W and M-M

Phoneme order of presentation: s, a, m, b, p, n, d. Words presented for generalization tasks were roughly the same as those in the W-P method listed below. Additionally, P-W and M-M children were taught the following as sight words: is, the, on.

W-P

Teaching Words	Sentences	Review	Generalization Test Words
Sam			
pat	pat, sam	sam	pam, sat, at
pam	pam, pat, sam	pat, sam	sat, and
sat	pam, sat		
	pat, sat		
	sam, sat		
and	sam and pat sat		and tap mat
	pam and pat sat		
tap	pam, tap sam		
	pat, tap pat and sam		
	sam and pat, tap pam		
on	pam sat on pat		
	pat and sam sat on pam		
	sam sat on pat and pam		mat, man, mad
the, mat	pam sat on the mat		
	tap the mat, sam		
	pam, tap the mat		
	pat and pam, tap the mat		man, map

Teaching Words	Sentences	Review	Generalization Test Words
man	the man sat		
	the man sat on the mat		
	pat and the man sat		
	the man and pat sat on the mat		stan, pad, add, ant
is	is pam on the mat?		
	the man is on the mat		
	sam is on the mat		
mad	the man is mad		
	pam is mad		
	is sam mad?		
at	is sam mad at pat?		
	the man is mad at pam		

UNIT 2

Phonemes (taught only for P-W)	Teaching Words (taught only for W-P)	Generalization Test Words - Decoding	Generalization Test Words - Encoding
i	dim sit tin did pin	nip, dit, mit, pim sip, min, mip, pit did, it sis, din	nis, dim, sit, tip tin, mis, sim, mid nim, in dip, sin
r	ran	rat, rad, rim, rip	ram, rap, rid, ris
l	sil lam	lit, till, sal, lam dill, lip, pimpl, land	mal, lat, lid, mill lim, appl, lamp, pil
c	mac can cat	sac, cap, tic, can cas, cal, cat, bic tac	cad, tac, lic, cal cad, cap, cas, mic cam
b	bit	bill, bad, rib	crab, ban, cab
f	fat in	flip, fill, af, raft, if	tin, laf, tan
ω	flω rib mωn laf sωt	lωt, sωn, rωm bωt, sω, rωd dω, pωl, rωt	drω, blω, mωd fωl, rωf, cωn tω, cωl, ωps

UNIT 3

Phonemes (taught only for P-W)	Teaching Words (taught only for W_P)	Generalization Test Words - Encoding	Generalization Test Words - Encoding
	fi	fiʃ, ʃip, caʃ	aʃ, diʃ, ʃab
k	kit	sick, kill, skɷl	skin, kiss, sack
e	let	ten, neck, send	men, sed, ʃell, red
h	hɷ	ha, hill	hem, hiz, hɷp
	hiz	haz, lab	penz, pill
g	gets	leg, gɷf	gɷs, rag
	gœs	gœ, nœ, nœ	fœn, shœ